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200. Proposed by **F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Defiance College, Defiance, O.**

No matter what value $x$ be given, the *numerical* value of the expression $(x+2)/(2x^2+3x+6)$ can never exceed $\frac{1}{3}$.

I. Solution by **G. B. M. ZERR, A. M., Ph. D., Parsons, W. Va.**

$(x+2)\,/\,(2x^2+3x+6)=1\,/\left(\dfrac{2x^2}{x+2}+3\right)$. The value of this fraction is greatest when $x=0$.

$\therefore (x+2)/(2x^2+3x+6)=\frac{1}{3}$ when $x=0$.

II. Solution by **M. E. GRABER, A. M., Heidelberg University, Tiffin, Ohio.**

Let $y=\dfrac{x+2}{2x^2+3x+6}$; then $\dfrac{dy}{dx}=\dfrac{(2x^2+3x+6)-4x^2-11x-6}{(2x^2+3x+6)^2}$.

Placing $dy/dx=0$ and solving we get $x=0,-4$. By considering the second derivative it is shown that $x=0$ corresponds to a maximum; substituting this value in $y$, we find $(y)_0=\frac{1}{3}$.

Also solved by L. E. Newcomb, Los Gatos, Cal.

201. Proposed by **H. B. LEONARD, B. S., Graduate Student, The University of Chicago.**

Solve by quadratics: $x+y+xy=75$; $x^2-y^2=315$.

Solution by **G. B. M. ZERR, A. M., Ph. D., Parsons, W. Va.**

The second equation may be written

$$x^2-y^2=324-9, \text{ or } y^2-9=x^2-324,$$

and therefore $y-3=\dfrac{x^2}{y+3}-\dfrac{324}{y+3}$. Also $y=\dfrac{75}{1+x}-\dfrac{x}{1+x}$, or $y-3=\dfrac{72}{1+x}-\dfrac{4x}{1+x}$. $\therefore x^2+4x\left(\dfrac{y+3}{1+x}\right)=324+72\left(\dfrac{y+3}{1+x}\right)$. Let $\dfrac{y+3}{1+x}=t$.

$\therefore x^2+4tx=324+72t$,

$x^2+4tx+4t^2=324+72t+4t^2$,

$x+2t=18+2t$, $x=18$, $y=3$.

The other values of $x$ and $y$ cannot be found by quadratics.*

## GEOMETRY.

226. Proposed by **W. J. GREENSTREET, A. M., Editor of The Mathematical Gazette, Stroud, England.**

The triangles $ABC$, $A'B'C'$ are in plane perspective, and the corresponding sides $BC$, $B'C'$, ....., cut in $P$, $Q$, $R$, respectively. $AA'$, ....., cut the line $PQR$ in $P'Q'R'$, respectively. Show that $(PP', QQ', RR')$ is an involution range.

No solution has been received.

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*Eliminating $y$ between the two given equations and dividing by $x-18$ there results $x^3+20x^2+45x+330=0$. The remaining values of $x$ are therefore obtainable from the solution of this cubic. Ed.